

FEC Grouping Semantics in SDP

draft-begen-mmusic-rfc4756bis-00

IETF 73 – November 2008

Ali C. Begen

abegen@cisco.com

FEC Framework Flexibility

- Framework Requirements:
 - Source and repair flows are carried in different flows
 - Each FEC scheme requires a different FEC Framework instance
- We'd like to support flexible source/repair flow grouping
 - A source flow **MAY** be protected by multiple instances
 - Within an instance, multiple repair flows **MAY** exist
 - Source flows **MAY** be grouped (combined) prior to FEC protection
- If multiple repair flows are associated with a source flow, we'd like to support
 - Additive repair flows that may be decoded jointly for better recovery chances
 - Prioritization among the repair flows

Source and Repair Flow Association

```
          SOURCE FLOWS                | FEC FRAMEWORK INSTANCE #1
      | S1: Source Flow |-----| R1: Repair Flow
+---|
      | S2: Source Flow
      |
+-----| FEC FRAMEWORK INSTANCE #2
          | R2: Repair Flow
```

- RFC 3388: An “m” line identified by its ‘mid’ attribute **MUST NOT** appear in more than one “a=group” line using the same semantics
- RFC 4756 (based on RFC 3388) would require us to write

a=group:FEC S1 S2 R1 R2

→ No particular association

- I-D.ietf-mmusic-rfc3388bis removed this requirement

Support for Additivity/Prioritization

```
SOURCE FLOWS | FEC FRAMEWORK INSTANCE #1
S4: Source Flow |-----| R5: Repair Flow
                |         | R6: Repair Flow
                |         |
                |-----| FEC FRAMEWORK INSTANCE #2
                |         | R7: Repair Flow
```

- Additivity
 - Multiple repair flows may be decoded jointly to improve the recovery chances
 - Additive repair flows can be generated by the same or different FEC schemes
- Prioritization
 - Prioritization lets receivers know in which order they **MUST** receive/decode the repair flows
 - The repair flows that are assigned a priority may or may not be additive
- **Currently, there is no SDP semantics for additivity/prioritization**

New Semantics (FEC-XR) – Examples

```
SOURCE FLOWS | FEC FRAMEWORK INSTANCE #1
S4: Source Flow |-----| R5: Repair Flow
                |         | R6: Repair Flow
                |         |
                |-----| FEC FRAMEWORK INSTANCE #2
                |         | R7: Repair Flow
```

- Association

a=group:FEC-XR S4 R5 R6

a=group:FEC-XR S4 R7

- Additivity

a=group:FEC-XR S4 R5 R6 → R5 and R6 are additive

a=group:FEC-XR S4 R7 → R7 is not additive

New Semantics (FEC-XR) – Examples

```
SOURCE FLOWS | FEC FRAMEWORK INSTANCE #1
S4: Source Flow |-----| R5: Repair Flow
                |         | R6: Repair Flow
                |         |
                |-----| FEC FRAMEWORK INSTANCE #2
                |         | R7: Repair Flow
```

- Association

a=group:FEC-XR S4 R5 R6

a=group:FEC-XR S4 R7

- Prioritization: Priority may be indicated by the order of the ‘mid’ values of the repair flows
 - For the example above $\rightarrow p(R5) > p(R6) > p(R7)$
 - **Open Issue: How do we signal equal priorities?**

Repair Flow SDP Descriptor

```
fec-repair-flow-line = "a=fec-repair-flow:" fec-encoding-id  
    [";" SP flow-priority]  
    [";" SP sender-side-scheme-specific]  
    [";" SP scheme-specific] CRLF
```

```
flow-priority = "priority=" priority-of-the-flow  
priority-of-the-flow = *DIGIT (OPTIONAL)
```

- Exact usage and rules **MAY** be defined by the FEC scheme or the CDP
- **Open Issue: How do we signal equal cross-scheme priorities?**

Comments/Feedback

- Suggestions for going forward?